The effect of different concentration NaCl and Hydroxyethyl starch on the hemorrhagic shocked dogs

(Group1) 7.5% NaCl/18% Hydroxyethyl starch (8ml/kg)
(Group2) 5.3% NaCl/9% Hydroxyethyl starch (8ml/kg)
(Group3) 5.3% NaCl/6% Hydroxyethyl starch (8ml/kg)
(Group4) 3.0% NaCl/9% Hydroxyethyl starch (8ml/kg)
(Group5) 3.0% NaCl/6% Hydroxyethyl starch (8ml/kg)
(Group6) 3.5% NaCl/6.5% Hydroxyethyl starch (8ml/kg)
infusion time was 20min

EXHIBIT A

Results

Table1. The effect on the mean arterial pressure (MAP) of the shocked dogs

	Pre-hemorrgage (mmHg)	preinfusion (mmHg)	infusion volume(1/2) (mmHg)	after infusion, the (MAP) recovered compared to the baseline (%) 10'	30'	1h	2h	3h	4h
G1:	128.42±13.05	50.30±6.00	85.22±8.23	75±3	78±5	82±6	81±10	79±9	81±7
G2:	125.32±6.93	43.73±5.67	85.47±3.50	82±8	83±10	84±11	87±10	86±6	85±8
G3:	123.93±5.61	45.27±2.10	80.74±4.67	77±6	81±5	82±6	82±7	80±9	81±8
G4:	139.08±6.59	45.75±3.68	80.25±4.39	70±8●	71±8●	74±10	75±6●	77±10	78±14
G5:	133.84±16.15	46.83±3.18	76.50±1.99	64±5	68±8	69±11	72±1	72±6	73±11
G6:	123.25±18.16	49.83±4.54	76.83±5.20	72±8	72±5	72±3	75±2	76±6	76±1

●: G4vs.G2 P<0.05

Table2. The effect on the myocardial contractility (MC) of the shocked dogs

	Pre-hemorrgage ($G \cdot cm/s^2$)	preinfusion ($G \cdot cm/s^2$)	infusion volume(1/2) ($G \cdot cm/s^2$)	after infusion, the (MC) recovered compared to the baseline (%) 10'	30'	1h	2h	3h	4h
G1:	0.99±0.09	0.33±0.04	0.62±0.06	74±4	76±5	85±8	83±11	80±10	84±12
G2:	0.97±0.07	0.30±0.03	0.62±0.04	81±8	87±12	87±14	92±13	90±10	88±15
G3:	0.94±0.06	0.32±0.02	0.61±0.04	78±2	84±6	85±5	84±5	81±7	81±7
G4:	1.07±0.06	0.33±0.04	0.60±0.03	69±9●	71±9●	76±11	77±13	77±11	80±18
G5:	1.05±0.15	0.35±0.03	0.57±0.02	68±5	68±10	67±12	71±6	72±7	74±9
G6:	0.92±0.18	0.36±0.05	0.57±0.06	73±8	73±5	73±2	77±3	78±10	76±4

●: G4vs.G2 P<0.05

Table3. The effect on the cardiac output (CO) of the shocked dogs

	Pre-hemorrgage (L/min)	preinfusion (L/min)	infusion volume(1/2) (L/min)	after infusion, the (CO) recovered compared to the baseline (%) 10'	30'	1h	2h	3h	4h
G1:	3.26±0.24	2.87±0.75	3.08±0.67	105±19	107±20	108±24	110±25	105±18	100±43
G2:	3.35±0.32	3.29±0.78	4.07±1.22	125±24	125±32	130±18	125±44	123±33	118±45
G3:	3.23±0.42	3.46±1.02	3.81±1.13	119±18	125±12	121±11	124±10	115±9	113±28
G4:	3.29±0.37	2.61±0.77	2 95±0.67	110±38	108±54	107±43	102±38	105±37	102±58
G5:	3.06±0.38	2.57±0.93	3.20±1.28	101±30	103±33	110±29	97±37	101±45	98±49
G6:	3.29±0.44	2.97±1.40	3.51±1.18	105±28	101±29	108±21	110±21	107±22	102±24

Table4.The effect on the biochemistry examination of the shocked dogs(Na)

	Pre-hemorrgage (mmol/L)	preinfusion (mmol/L)	after infusion 30'	after infusion 3h
G1:	142.00±5.63	138.27±2.64	169.00±18.26	151.60±12.13○
G2:	135.81±7.26	141.76±2.42	159.00±6.23	154.41±8.56
G3:	141.20±6.42	140.20±4.76	154.40±5.22	147.60±5.27○
G4:	140.50±12.4	139.25±2.63	151.75±6.70	141.75±10.72●
G5:	139.75±7.39	140.25±3.59	154.00±2.94	142.25±3.30○○
G6:	143.00±5.77	140.25±2.22	158.25±8.81	146.50±10.38

●: G4vs.G2 P<0.05 vs.30' P<0.05(○) P<0.01(○○)

Table5.The effect on the biochemistry examination of the shocked dogs(Cl)

	Pre-hemorrgage (mmol/L)	preinfusion (mmol/L)	after infusion 30'	after infusion 3h
G1:	111.00±8.11	112.18±5.42	143.22±7.77	132.62±6.73○
G2:	112.80±6.25	118.70±3.30	133.40±4.22	129.80±5.66
G3:	114.00±2.55	116.80±3.11	129.80±3.96	127.60±1.14
G4:	111.50±3.00	115.25±5.19	124.00±3.74●	121.00±4.16●
G5:	112.50±3.42	116.00±2.94	124.75±1.89	120.75±2.50○
G6:	108.75±0.96	111.50±4.20	125.00±2.58	122.75±3.86

●: G4vs.G2 P<0.05, ○: vs.30' P<0.05

Table6.The effect on the biochemistry examination of the shocked dogs(Cr)

	Pre-hemorrgage (μmmol/L)	preinfusion (μmmol/L)	after infusion 30'	after infusion 3h
G1:	53.61±28.01	101.23±29.52	102.11±23.65	83.56±25.11
G2:	62.00±23.55	106.22±12.31	91.00±11.15	82.32±12.66
G3:	51.40±16.95	91.20±20.61	74.00±21.94	70.80±24.16
G4:	97.00±22.70	121.00±25.78	104.50±22.43	88.75±13.23
G5:	68.50±13.10	110.00±29.06	90.50±29.49	75.25±18.89
G6:	64.00±41.09	107.75±46.13	99.00±34.26	97.33±31.01

DISCUSSION(teaching)

The results showed that the concentration of NaCl was not the higher the better. As the data indicated that the effect of G1(7.5% NaCl) is not so good as G2(5.3% NaCl). There is the possibility that G1's effect might be counteracted by its side effect. The experiment tests their effects on the hemorrhagic shocked dogs, and the result showed the degree of their effect: G2>G1>G3>G4>G6>G5. A high concentration of NaCl may cause pontine myelinolysis. It is important that medicine research must fully consider the safety and the validity of the medicine. In this experiment, the function of the Artificial Colloid is minor. As for resuscitation, the results showed that the high concentration of NaCl may cause overresuscitation, while the low concentration of NaCl may result in underresuscitation. It has "the endpoint" on antishock (Tobias TA, et al. Circ-Shock 1993;398:139-146), so we reckon that the concentration of NaCl has certain range.

References

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